

TABLE 3.—Daily totals and departures of solar and sky radiation during November, 1919.

[Gram-calories per square centimeter of horizontal surface.]

Day of month.	Daily totals.			Departures from normal.			Excess or deficiency since first of month.		
	Wash- ington.	Madi- son.	Lin- coln.	Wash- ington.	Madi- son.	Lin- coln.	Wash- ington.	Madi- son.	Lin- coln.
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Nov. 1.....	77	295	334	-175	104	91	-175	104	91
2.....	284	211	222	34	22	-19	-141	126	72
3.....	234	153	261	-14	-34	22	-155	92	94
4.....	146	214	288	-101	29	51	-256	121	145
5.....	251	208	276	6	25	41	-250	146	186
6.....	342	36	97	100	-145	-136	-150	1	50
7.....	203	100	50	-36	-78	-182	-186	-77	-132
8.....	173	44	36	-63	-132	-194	-249	-209	-325
9.....	286	35	51	53	-138	-178	-196	-347	-504
10.....	287	164	124	57	-7	-103	-139	-354	-607
11.....	22	262	260	-205	94	34	-344	-260	-573
12.....	102	259	362	-122	93	138	-466	-167	-435
13.....	253	261	335	33	98	112	-433	-69	-323
14.....	233	252	296	66	91	75	-367	22	-248
15.....	237	190	289	43	-5	30	-324	53	-179
16.....	244	151	248	33	-5	30	-291	48	-149
17.....	256	171	268	48	17	51	-243	65	-98
18.....	270	228	248	64	76	33	-179	141	-65
19.....	171	189	283	-32	39	69	-211	180	4
20.....	263	197	181	63	49	-31	-148	229	-27

TABLE 3.—Daily totals and departures of solar and sky radiation during November, 1919—Continued.

Day of month.	Daily totals.			Departures from normal.			Excess or deficiency since first of month.		
	Wash- ington.	Madi- son.	Lin- coln.	Wash- ington.	Madi- son.	Lin- coln.	Wash- ington.	Madi- son.	Lin- coln.
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Decade departure.....							-9	583	580
Nov. 21.....	224	31	275	27	-115	64	-121	114	37
22.....	63	217	245	-131	73	36	-252	187	73
23.....	248	185	242	56	43	34	-196	230	107
24.....	213	145	235	24	5	29	-172	235	136
25.....	147	26	58	-39	-112	-147	-211	123	-11
26.....	62	132	39	-122	-5	-164	-333	118	-175
27.....	225	155	118	44	19	-83	-289	137	-258
28.....	168	40	105	-11	-95	-98	-300	42	-351
29.....	40	32	231	-137	-102	35	-437	-60	-316
30.....	265	227	255	90	94	61	-347	34	-255
31.....									
Decade departure.....							-199	-195	-228
Excess or deficiency since first of year:									
Gr.-cal.....							-7189	-4602	-4548
Per cent.....							-6.0	-4.0	-3.4

## MEASUREMENTS OF THE SOLAR CONSTANT OF RADIATION AT CALAMA, CHILE.

By C. G. ABBOT, Director.

[Dated: Astrophysical Observatory, Smithsonian Institution, Washington, Dec. 22, 1919.]

In continuation of preceding publications I give in the following table the results obtained at Calama, Chile, in October, 1919, for the solar constant of radiation. The reader is referred to this REVIEW for February, August, and September, 1919, for statements of the arrangement and meaning of the table.

The observers report that the cloudiness for the month of October exceeded that for any month since the beginning of their observations in July, 1918. If they were still dependent upon the old fundamental method of observing they would have secured not over 12 days' results during the month. They have worked up additional data as a basis for applications of the new method at times when the sun is very near the zenith and hereafter many of the results will be based on observations at air masses not exceeding 1.5.

Aside from the unusually broken series of observations during the month, the most outstanding feature is the unusually low value for October 7, which is strongly supported by three independent determinations—one by the old method and two by the new. As was stated in the last report, the average value of the solar constant for the month of September was about 1 per cent below that for the month of August and apparently the depression of solar radiation reached its minimum on October 7. Solar radiation then suddenly rebounded to a value above the average for the year and continued high and even reached values unusually high during the last decade of the month.

Date.	Solar Const.	Method.	Grade.	Trans- mission coefficient at 0.5 mi.- cron.	Humidity.			Remarks.
					$\rho/\text{psc}$	V. P.	Rel. Hum.	
1919. October A. M.	cal.							
2	1.944	E <sub>0</sub>	G+	0.859	0.335	Cm.	P. ct. 33	Cirri in east and west.
7	1.837	E <sub>0</sub>	VG-	.839	.365		15	Bank of cumuli in east.
	1.885	M <sub>2</sub>						Some cirro-cumuli in west.
	1.912	M <sub>2</sub>						
	1.891	W. M.						

Date.	Solar Const.	Method.	Grade.	Trans- mission coefficient at 0.5 mi.- cron.	Humidity.			Remarks.
					$\rho/\text{psc}$	V. P.	Rel. Hum.	
1919. October A. M.	cal.							
8	1.954	M <sub>2</sub>	S	.865	.462	Cm.	P. ct. 17	
	1.967	M <sub>2</sub>						
	1.963	W. M.						
9	1.942	M <sub>2</sub>	S	.862	.492	.18	17	
	1.951	M <sub>2</sub>						
	1.948	W. M.						
10	1.934	E <sub>0</sub>	VG	.865	.438	.20	19	Distant cirri in northeast.
	1.975	M <sub>2</sub>						
	1.964	M <sub>2</sub>						
	1.961	W. M.						
11	1.955	M <sub>2</sub>	S	.847	.442	.23	21	
	1.950	M <sub>2</sub>						
	1.952	W. M.						
12	1.923	M <sub>2</sub>	U+	.824	.420	.29	27	Cirri in west.
	1.962	M <sub>2</sub>						
	1.949	W. M.						
13	1.929	M <sub>2</sub>	S-	.848	.502	.24	27	
	1.954	M <sub>2</sub>						
	1.946	W. M.						
14	1.931	M <sub>2</sub>	S	.874	.609	.16	16	
	1.950	M <sub>2</sub>						
	1.940	W. M.						
15	1.979	E <sub>0</sub>	VG+	.857	.626	.13	15	
	1.958	M <sub>2</sub>						
	1.954	M <sub>2</sub>						
	1.959	W. M.						
17	1.934	M <sub>1.2</sub>	S-	.856	.700	.25	14	Cirri over most of sky.
19	1.936	M <sub>2</sub>	S-	.860	.526	.17	18	
	1.960	M <sub>2</sub>						
	1.955	W. M.						
20	1.952	M <sub>2</sub>	S+	.858	.506	.18	17	Low bank of cirri in east.
	1.954	M <sub>2</sub>						
	1.953	W. M.						
21	1.968	E <sub>0</sub>	VG+	.851	.476	.19	19	Distant cirri in south.
	1.978	M <sub>2</sub>						
	1.958	M <sub>2</sub>						
	1.965	W. M.						
A. M.								
23	1.950	M <sub>2</sub>	S	.864	.588	.19	9	Cirri scattered about sky.
	1.938	M <sub>1.2</sub>						
	1.946	W. M.						
24	1.970	E <sub>0</sub>	G	.832	.508	.19	19	Cirri in north and east.
	1.958	M <sub>2</sub>						
	1.962	W. M.						
25	1.964	M <sub>1.2</sub>	S-	.855	.600	.23	19	Scattered cirri rapidly moving east.
26	1.971	M <sub>2</sub>	S	.846	.471	.22	26	Some thin cirri scattered about, especially in west.
	1.971	M <sub>2</sub>						
28	1.971	W. M.						
	1.957	M <sub>1.2</sub>	S-	.860	.689	.25	18	Cirri around east, south and west, and very thin cirri over rest of sky.
31	1.958	M <sub>1.2</sub>	S-	.847	.735	.15	10	Cirri scattered about sky, especially in east.